

DIAGNOSIS OF NEW GENERA AND SPECIES OF DEEP-SEA FISH-LIKE VERTEBRATES.

By THEODORE GILL.

The explorations of the United States Fish Commission steamer Albatross, under the command of Capt. Z. L. Tanner, were unusually successful during the past summer, in the discovery of hitherto unknown species and higher types of fishes, as well as other animals. At the invitation of the Commissioner, Professor Baird, I have examined the collection made during the several trips of the year, and have found no less than eighteen new species of fish-like vertebrates—one Myzont, one Selachian, and sixteen true Fishes. Diagnoses of most of these are here given, but those of four others—one Eurypharyngoid and three Nemichthyoid fishes—will be immediately published in other articles by the present author in conjunction with Mr. John A. Ryder, whose skill as an anatomist, as well as an artist, has rendered his aid invaluable. Hereafter, more full descriptions and illustrations will be given of the forms now diagnosed.

CLASS OF MYZONTS.

PETROMYZONTIDÆ.

Petromyzon (Bathymyzon) Bairdii.

CLASS OF SELACHIANS.

CHIMÆRIDÆ.

Chimæra abbreviata.

CLASS OF FISHES.

EURYPHARYNGIDÆ.

Gastrostomus Bairdii.

NEMICHTHYIDÆ.

Serrivomer Beanii.

Spinivomer Goodei.

Labichthys carinatus.

Labichthys elongatus.

SYNAPHOBRANCHIDÆ.

Histiobranchus infernalis.

NOTACANTHIDÆ.

Notacanthus analis.

CHAULIODONTIDÆ.

Sigmops stigmaticus.

STOMIATIDÆ.

Hyperchoristus Tanneri.

ALEPOCEPHALIDÆ.

Alepocephalus productus.

HALOSAURIDÆ.

Halosaurus Goodei.

BERYCIDÆ.

*Plectromus suborbitalis.**Stephanoberyx Monæ.**Caulolepis longidens.*

BROTULIDÆ.

Bassozetus normalis.

GADIDÆ.

Onos rufus.

MACRURIDÆ.

Macrurus Bairdii (Goode & Bean).

DESCRIPTIONS OF SPECIES.

PETROMYZONTIDÆ.

Petromyzon (*Bathymyzon*) *Bairdii*.

A lamprey closely related to the common sea lamprey (*Petromyzon marinus*) but with the suproral and infroral plates or laminae destitute of odontoid tubercles, the armature of the lamprey type being obsolescent.

Inasmuch as the character which thus distinguishes the species contradicts the generic diagnosis attributed to the genus by Günther, Jordan and Gilbert, and other ichthyologists, it may be at least subgenerically distinguished, on account of the obsolescence of the denticles, under the name BATHYMYZON.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33311	2048	° ' "	° ' "	547	1

CHIMAERIDÆ.

Chimæra abbreviata.

The snout is moderately produced and the subrostral contour very oblique; the ante-orbital flexure of the suborbital line ascends almost as high as the upper margin of the pupil; the dorsals are scarcely separated by an interspace and the spine of the first is acutely angulated and keeled in front; the pectorals extend nearly to the inner axils of the ventrals; the latter are acutely angulated; the tail is abbreviated and only about as long as the head (from the snout to the transverse nuchal line); the color is dark yellow (in life) or brownish, while the

fins are rather plumbeous, except the second dorsal, which has a longitudinal basal band, nearly uniform with the trunk, about as wide as a third of the fin's height, extending the entire length.

The single specimen of this species is nearly three feet long.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33435	2084	° ' " 40 16 50	° ' " 66 58 00	1,290	1

EURYPHARYNGIDÆ.

Gastrostomus Bairdii Gill & Ryder.

NEMICHTHYIDÆ.

Serrivomer Beanii Gill & Ryder.

Spinivomer Goodei Gill & Ryder.

Labichthys carinatus Gill & Ryder.

Labichthys elongatus.

SYNAPHOBRANCHIDÆ.

HISTIOBRANCHUS.

Synphobranchid with the dorsal fin protracted almost as far forward as the base of the pectoral fin, and an isolated small patch of teeth on the vomer behind that on its head.

Histiobranchus infernalis.

The dorsal fin commences little behind the root of the pectoral (15 : 100 of length), while the anal arises not much nearer the snout than the end of the tail; the pectorals are considerably shorter than the snout.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33279	2037	° ' " 38 30 30	° ' " 69 08 25	1,731	1

NOTACANTHIDÆ.

Notacanthus analis.

A Notacanthus with about eighteen anal spines, eleven dorsal spines, and a posterior ray, the length of the snout and diameter of the orbit subequal and greater than the interorbital area, and the snout projecting about one-third of its own length beyond the mouth.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33327	2048	° ' " 40 02 00	° ' " 68 50 30	547	1

CHAULIODONTIDÆ.

SIGMOPS.

Chauliodontids without scales or pseudobranchiæ, with an elongated claviform body, a short dorsal and long anal, commencing opposite to each other, and with moderately elongated teeth, alternating with several short ones, in a row along the supramaxillaries as well as intermaxillaries and mandible.

Sigmops stigmaticus.

The only species of the genus; its distinct inferior pearly spots, arranged in two rows on each side of the abdomen, are well marked, and the upper have wax-like guttiform spots connected with them below; there is also a broad longitudinal silvery band or sheen.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33291	2039	° ' " 38 19 26	° ' " 68 20 20	2,361	1

STOMIATIDÆ.

HYPERCHORISTUS.

Stomiatics with a robust claviform body, naked skin, teeth on the jaws nearly uniserial, but in several groups of which the successive teeth (about 4) rapidly increase in size backwards, and teeth on the palate enlarged, one on each side of the vomer and several on the palatines; moderate dorsals obliquely opposed, forked caudal, and pectorals each with a separate and specialized uppermost ray.

Hyperchoristus Tanneri.

A black fish with formidable teeth, which was so lively when brought to the surface that it twisted itself round in its attempt to bite the commander of the vessel, Captain Tanner.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33444	2083	° ' " 40 26 40	° ' " 66 58 00	956	1

ALEPOCEPHALIDÆ.

Alepocephalus productus.

This species agrees closely with *A. Agassizii*, but the eye is considerably smaller, its diameter equaling less than a quarter of the head's

Vol. VI, No. 17. Washington, D. C. Nov. 27, 1883.

length, while the snout is half as long again as in *A. Agassizii*, and forms little less than a third of the length of the head.

N. M. No.	Station.	Lat.			Long.			Fathoms.	Specimens.
		°	'	"	°	'	"		
33341	2035	39	26	16	70	02	37	1,362	1

Halosaurus Goodei.

B. 12. D. I. 10-11. V. I. 8.

The snout is moderately produced, its preoral portion forming two-sevenths ($H. m. \frac{2}{7}$) of its length; the eye is small, equal to one-fifth ($H. m. \frac{1}{5}$) of the postocular portion of the head, and less than one-half ($1 : 2\frac{1}{2}$ c. $H. m. 1 : 2$) of the width of the interorbital space. The head is longer than the distance between it and the root of the ventral; the supra-maxillary reaches the vertical of the front margin of the eye; the dorsal is entirely behind the ventrals; the anal commences as far behind the root of the ventrals as the latter is behind the preoperculum; the pectorals nearly reach backward to the ventrals; the squamation is similar to that of the *H. macrochir*.

This species has been confounded with the *H. macrochir* by previous writers, and it is certainly very nearly related to it, but it appears to be specifically separable by the number of rays in the dorsal and ventral fins and the proportions of those parts contrasted above. I take pleasure in dedicating it to my friend, Prof. G. Brown Goode, who first, in union with Dr. Bean, determined its existence, as well as its near relationship to *H. macrochir*.

N. M. Nos.	Station.	Lat.			Long.			Fathoms.	Specimens.
		°	'	"	°	'	"		
33281	2037	38	53	00	69	23	30	1,731	1
33312	2051	39	41	00	69	21	20	1,106	1
33330	2051	39	41	00	69	21	20	1,106	10
33336	2035	39	26	16	70	02	37	1,362	3
33338	2052	39	40	05	69	21	25	1,098	10

BERYCIDÆ.

PLECTROMUS.

Berycids with an elongated form, moderate cycloid scales, an oblong head with a much decurved or truncate snout, rather small eyes, and teeth small, acute, and in two rows in each jaw, of which those of the inner row (at least in the lower jaw) are largest, and palate toothless.

Plectromus suborbitalis.

The color is black. The dorsal fin has three spines and sixteen rays, and the anal one spine and eight rays. Two spines—one on each side of the nape—springing forward from the shoulder bones, give a strange appearance to the fish, and have gained for it the generic name *Plectromus* (*plectron*, spur, and *omos*, shoulder).

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33271	2036	° ' "	° ' "	1,735	1

STEPHANOBERYX.

Berycids with an elongated claviform contour, body covered with cycloid scales scarcely imbricated and armed about the center with one or two erect spines; an oblong head with a moderate convex snout, and with thin osseous ridges, especially an inner U-shaped one on the crown whose limbs diverge on each side of the nape, and an outer sigmoid one on each side above the eyes and continuous with one projecting from the nasal; the inner and outer ridges connected by a cross-bar on a line with the anterior margin of the orbit; rather small eyes in the anterior half of the head, and the teeth small, acute, and in a band on the intermaxillaries and dentaries (palate toothless); and with ventrals having one spine and five rays.—Closely allied to *Melamphaes*.

Stephanoberyx Monæ.

A small fish of a brownish color, which exhibits a beautiful system of crests, ridges, and spines on the head. D. 14. A. 13. P. 10. V. I. 5.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33445	2077	° ' "	° ' "	1,253	1

CAULOLEPIS.

Berycids with a laterally oval or broad pyriform contour a compressed body covered with small pedunculated leaf-like scales, an abruptly declivous forehead, small eyes, a pair of very long pointed teeth in front of upper jaw closing in front of lower, a similar pair of still longer pointed teeth in the lower received in foveæ of the palate; on the sides of each jaw two long teeth terminating in bulbous tips, a row of minute teeth on the posterior half of the supramaxillaries, and a toothless palate.—Closely related to *Anoplogaster*.

Caulolepis longidens.

The color is a uniform black; there are two spines and seventeen rays in the dorsal fin, and two spines and eight rays in the anal; the front

teeth of the lower jaw are of enormous length (nearly twice as long as those of the upper), but the scales exhibit the most remarkable peculiarity.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33270	2034	° ' " 39 27 10	° ' " 69 56 20	1,346	1

BROTULIDÆ.

BASSOZETUS.*

Dinematichthyine brotulids with a slender body, a narrow differentiated caudal fin, anus about a third of the total length from the snout, small eyes, and unarmed head and shoulders.

Bassozetus normalis Gill.

The greatest height little exceeds an eighth of the total length, and the head enters nearly five and a half (18.5 100) times in the latter; the caudal has 9 rays, and its length equals the width of the head.

N. M. No.	Station.	Lat.	Long.	Fathoms.	Specimens.
33306	2042	° ' " 39 33 00	° ' " 68 26 45	1,555	1

GADIDÆ.

Onos rufus.

There are three barbels (and no accessory ones); the enlarged dorsal ray is as long as, or longer than, the head; some enlarged brown-colored teeth are developed in the exterior row, and the color in life is an almost uniform salmon or brick-red hue. It is closely related to the *Onosensis* of Greenland and may possibly prove to be identical with it, but nothing has been stated with regard to the color of that species, a feature too striking to be overlooked.

N. M. No.	Station.	Latitude.	Longitude.	Fathoms.	Specimen.
33297	2051	° ' " 39 41 00	° ' " 69 20 20	1,106	1

MACRURIDÆ.

Macrurus Bairdii Goode & Bean.

The tail is very long and slender, the height diminishing to an equality with the diameter of the orbit considerably within the anterior half of the total length, and thence regularly attenuated to the end; the head forms little more than a sixth of the length; the eye is very large,

* βάσσων (Doric Greek) deep, and ξήτων, seeker.

the diameter exceeding a third of the head's length; the interorbital space is little more than a quarter of the same length, and the snout is considerably less than a third; the latter, viewed from above, is subquadrate, but with an anterior median projection and its bounding ridges emarginated; the rostro-suborbital is well defined and continues backward toward the interior limb of the preopercle, while the lower surface of the snout and below the suborbital ridge are well developed; the mouth is rather small; the opercle is also comparatively small and triangular, the posterior margin being nearly rectilinear; the dorsal spine is about as long as the head from the front of mouth to the tip of opercle, and is armed with strong spines appressed upwards; the pectorals reach backward to the vertical of the fourth or fifth anal ray, and the filamentary ventrals to about the third ray.

D. (1) II. 10, (2) 133. A. 119. P. 15. V. 7.

The scales are quite small, there being about 27 longitudinal rows in front (6 + 1 + 20), and are characteristic in their armaturè, there being generally 15 or 16 (13-20) rows of alternating subequal spines on the surface and no approach to union of any into keels.

The color, in alcohol, is yellowish-brown, merging into bluish on the abdomen.

N. M. Nos.	Station.	Latitude.	Longitude.	Fathoms.	Specimens.
33418	2062	° ' " 42 17 00	° ' " 66 32 00	150	15
33406	2064	3

DIAGNOSES OF NEW GENERA OF NEMICHTHYOID EELS.

By THEODORE GILL and JOHN A. RYDER.

Hitherto only three species have been recognized among the Nemichthyoid eels—three species of *Nemichthys* (*N. scolopaceus*, *N. avocetta*, and *N. infans*) and one representing an isolated type that possibly represents another family—the genus *Cyema* of Dr. Günther. But the trawling operations of the United States Fish Commission steamer Albatross were rewarded in 1883 by the finding of not less than four species representing three hitherto unknown modifications of structure necessitating generic distinction. One of these forms was in most respects closely allied to the ordinary long known type, but the other two were very different. Diagnoses of the new types are here offered in advance of the publication of more detailed descriptions and illustrations at some other time.

SERRIVOMER.

Nemichthyids with the head behind eyes of an elongated parallel-gramic form, with moderately attenuated jaws, branchiostegal membrane confluent at posterior margin, but with the branchial apertures limited by an isthmus except at the margin, and with lancet-shaped vomerine teeth in a crowded (sometimes doubled) row.